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Massachusetts Health Care Cost Trends

Preventable Hospitalizations

August 2012

DIVISION OF
Health Care
Finance and Policy

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Executive Summary

Identifying and quantifying inefficiencies in the health care system can assist policymakers in developing interventions that increase value by lowering costs and improving quality. Hospital costs account for the largest proportion of overall health care expenditures, both nationally and in Massachusetts.[1,2] Measures of potentially preventable hospitalizations estimate the prevalence of an expensive yet poor outcome that may have been avoided if patients had better access to primary and preventive care, chronic disease management services, or an integrated health system that treats patients in the most efficient care setting.[3]

This report examines preventable hospitalizations by using the federal Agency for Healthcare Research and Quality (AHRQ) Prevention Quality Indicators (PQIs). The AHRQ PQI software identifies hospital admissions for ambulatory care sensitive conditions (ACSCs), and aggregates them to calculate the volume and rates of preventable hospitalizations. The ACSCs encompass a spectrum of chronic and acute conditions; this report analyzes twelve of these over three years to identify preventable hospitalizations for persons 18 and older (Table 1). Hospitalizations for ACSCs are considered preventable because, for these conditions, good outpatient care can potentially prevent the need for hospitalization, or early intervention can prevent complications or more severe disease.[4] Thus, the data serve as a proxy for evaluating whether residents are accessing care at the appropriate level to avoid poor health outcomes, and as a measure of statewide performance with regard to system efficiency. Moreover, because hospitalizations are costly, reducing preventable hospitalizations has the potential to both increase quality and reduce costs.

Table 1. AHRQ-defined Preventable Hospitalization (PH) Conditions

PH Category	PH Condition
Chronic - Diabetes	Diabetes short-term complications
	Diabetes long-term complications
	Uncontrolled diabetes
	Lower-extremity amputations among patients with diabetes
Chronic - Respiratory	Chronic Obstructive Pulmonary Disease (COPD) and asthma in older adults (40+)
	Asthma in younger adults (18 to 39)
Chronic - Other	Hypertension
	Congestive Heart Failure (CHF)
	Angina without procedure
Acute	Dehydration
	Bacterial Pneumonia
	Urinary Tract Infection (UTI)

1 Jiang, H.J. (AHRQ), Russo, C.A. (Thomson Reuters), and Barrett, M.L. (M.L. Barrett, Inc). *Nationwide Frequency and Costs of Potentially Preventable Hospitalizations, 2006*. HCUP Statistical Brief #72. April 2009. U.S. Agency for Healthcare Research and Quality, Rockville, MD.

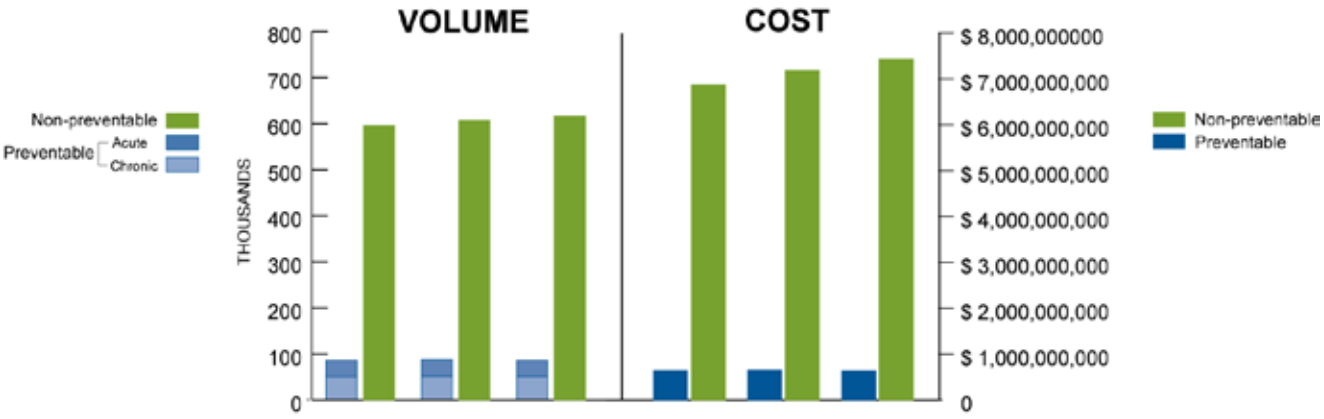
2 Division of Health Care Finance and Policy. *Massachusetts Health Care Cost Trends: Trends in Health Expenditures,* June 2011.

3 Stranges, E., Stocks, C. *Potentially Preventable Hospitalizations for Acute and Chronic Conditions, 2008.* HCUP Statistical Brief #99. November 2010. Agency for Healthcare Research and Quality, Rockville, MD.

4 Stranges, E., Stocks, C. *Potentially Preventable Hospitalizations for Acute and Chronic Conditions, 2008.* HCUP Statistical Brief #99. November 2010. Agency for Healthcare Research and Quality, Rockville, MD.

Between 2008 and 2010, preventable hospitalizations (PHs) represented 12 percent of all adult inpatient admissions. In 2010, these hospitalizations accounted for approximately $641 million in hospital costs, representing 8 percent of total inpatient costs in Massachusetts.[5] Total costs for preventable hospitalizations decreased marginally from 2008 to 2010, while the total cost for non-preventable hospitalizations increased 8.1 percent. The stability of costs over time for preventable hospitalizations is encouraging in the context of a health care cost environment that has otherwise experienced consistent growth.

Figure 1



Of the preventable hospitalizations considered in this study, the majority (59%) were for chronic conditions, with acute conditions accounting for 41 percent. The most common PH conditions evaluated are Congestive Heart Failure (CHF), Chronic Obstructive Pulmonary Disease and Asthma in older adults (COPD/Asthma), and Bacterial Pneumonia. Together, these three conditions represent almost two-thirds of all preventable hospitalizations (62%) across all three years of the study period (2008-2010).

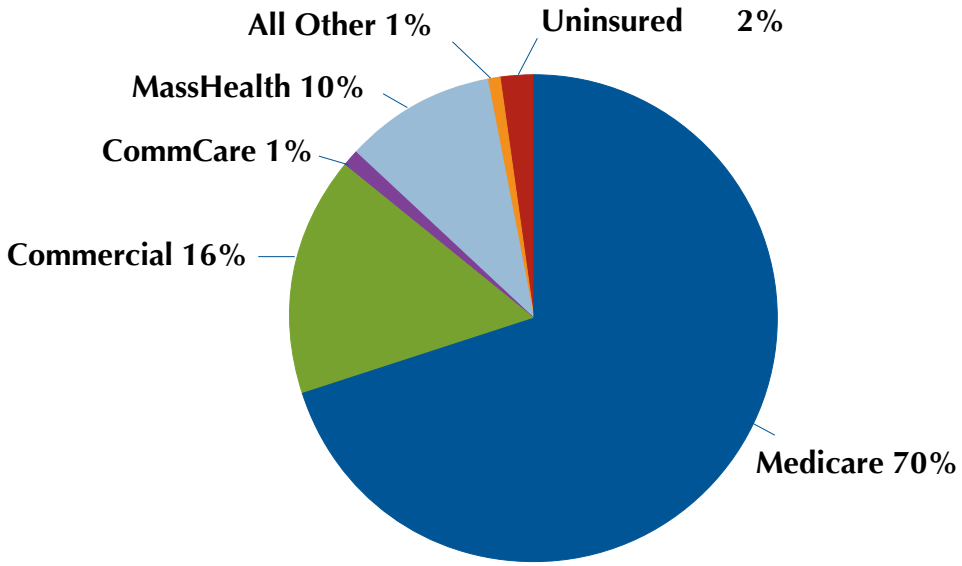
Although preventable hospitalizations have not experienced the volume and cost growth rates of other medical services, they remain a significant expenditure that represents inefficiency in health care delivery resulting in poor quality outcomes for patients.

5 In order to estimate costs, a statewide inpatient cost to charge ratio has been applied to hospital charges associated with PHs. When dividing the estimated cost by the volume of services, an average cost per service is derived. Please reference Appendix B for a detailed explanation of the cost to charge ratio and how it is applied.

Trends in PH Costs

Overall, Medicare was the primary payer for 70 percent of all discharges for PH conditions in 2010 (64% of PH hospitalizations occurred in adults over age 65); Medicare is the predominant insurance program for this population. Beneficiaries of commercial health plans accounted for 16 percent of PH discharges, and Medicaid beneficiaries for 10 percent. Figure 2 below displays the proportions of enrollment volume and PH volume by payer type in 2010.

Figure 2. Volume of Preventable Hospitalizations by Payer Type, 2010



Out of the twelve PH conditions, five account for 85 percent of the PH volume and 83 percent of the PH costs. These proportions were consistent over the three years. Table 2 displays the 2010 volume, total costs, and median hospitalization costs for the twelve PH conditions covered in this analysis. The overall hospitalization rate has improved for three measures, Dehydration, Congestive Heart Failure, and Bacterial Pneumonia. Two conditions have seen increased rates of hospitalizations — COPD/Asthma in older adults and urinary tract infections (UTIs).[6]

6 Clinical definitions for these conditions can be found in Appendix B of this report. Tables A.7 through A.11 in Appendix A of this report provide detailed demographic breakdown of PH rates for the listed conditions.

Table 2. Costs and Volume of Preventable Hospitalizations by Condition, 2010

	PH Volume	Total Cost	Median Cost per Discharge
Congestive Heart Failure (CHF)	19,418	$159,889,430	$5,905
COPD and Asthma in Older Adults (40 and older)	18,412	$123,178,425	$5,008
Bacterial Pneumonia	16,449	$132,389,576	$5,571
Urinary Tract Infection (UTI)	11,748	$70,855,978	$4,733
Dehydration	7,562	$44,230,422	$4,384
Diabetes Long-Term Complications	5,566	$57,098,055	$5,937
Hypertension (high blood pressure)	2,460	$14,157,397	$4,489
Diabetes Short-Term Complications	2,332	$17,450,642	$5,084
Asthma in Younger Adults (18-39)	1,441	$6,438,059	$3,371
Angina without Procedure	700	$3,655,096	$4,099
Lower-Extremity Amputation among Patients with Diabetes	623	$14,249,280	$16,107
Diabetes, Uncontrolled	588	$3,051,007	$3,818
Total	87,006	$640,878,341	N/A

Notes: The volume and total costs displayed for each condition do not sum to the total due to diabetes-related hospitalizations being counted in more than one condition-specific calculation.

Overall, total and median costs of preventable hospitalizations were stable from 2008 to 2010, although there was some variation in costs over the period for some less common conditions. For example, the median cost per admission for lower extremity amputation among patients with diabetes increased 10.3 percent while the median cost per admission for hypertension declined by 6.9 percent over the same time period. However, these two conditions represent only 4 percent of the total cost of preventable hospitalizations in Massachusetts.

Congestive Heart Failure, with the highest volume, resulted in nearly $160 million in hospitalization costs in 2010, and accounted for 25 percent of total PH costs. Between 2008 and 2010, the state-wide PH rate for CHF decreased approximately 5 percent, from 405 to 384 hospitalizations per 100,000 persons. This condition is found primarily in older adults, with the rate for persons 75 and older double that of younger adults. Therefore any savings resulting from the decreased rate would likely have accrued to Medicare.

Although lower-extremity amputation among patients with diabetes represented a much smaller proportion of total PH volume (only 0.7%), this condition had the highest median cost per discharge of $16,107. Excluding this outlier, the median costs per discharge for PH conditions were fairly similar, ranging from $3,371 for asthma in younger adults and $5,937 for diabetes long-term complications. Of the five PH conditions with highest median cost per discharge, three were for diabetes-related hospitalizations. Better outpatient care management for diabetes can be provided at a much lower cost than hospitalization, and would likely improve patients' health status.[7,8]

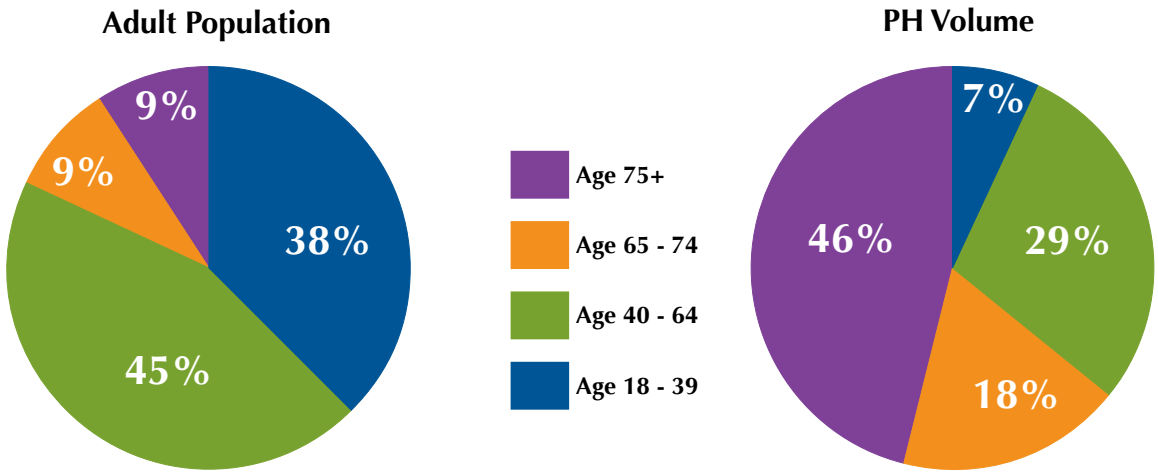
7 Sidorov J, Shull R, Tomcavage J, Girolami S, Lawton N, Harris R. "Does diabetes disease management save money and improve outcomes?" *Diabetes Care.* 2002: 25, no. 4; 684-689.

8 Herman WH, Fajans SF. "The economics of diabetes prevention." *Med Clin North Am*. 2011 March; 95(2) 373-viii.

Demographic Trends in Preventable Hospitalizations

The demographic breakdown of preventable hospitalization rates in Massachusetts is consistent with similar studies at the national level.[9] Although adults over 65 represent only 14 percent of the statewide population, they are disproportionately represented in PH admissions. Nearly half of all PH admissions are for persons ages 75 and older; 64 percent are for persons over 65 years (Figure 3). Men in Massachusetts have slightly higher rates than women for all PH conditions, and non-Hispanic Blacks have higher rates for all PHs compared to Hispanics and Non-Hispanic Whites.[10]

Figure 3. Massachusetts Distributions of Adult Population and Preventable



9 Stranges, E., Stocks, C. *Potentially Preventable Hospitalizations for Acute and Chronic Conditions, 2008.* HCUP Statistical Brief #99. November 2010. Agency for Healthcare Research and Quality, Rockville, MD.

10 The categories of race and ethnicity used throughout this report are from definitions developed by the federal Office of Management and Budget (OMB) 1997. "Revisions to the standards for the classification of federal data on race and ethnicity." *Federal Register 62*:58781-58790.

Hospitalizations by Age, 2010

As primary care access and care coordination have the potential to improve overall health and avoid exacerbation of chronic conditions, it is not surprising that vulnerable populations, for whom such access is typically limited, have higher rates of preventable hospitalizations.[11] Adults age 65 and older are more likely to be hospitalized with a preventable condition, and account for over half of preventable hospitalizations for chronic conditions and nearly two-thirds of preventable hospitalizations for acute conditions nationwide.[12]

Disparities in Preventable Hospitalizations

There are significant disparities in rates of preventable hospitalizations by socioeconomic status. Strong evidence suggests that disparities in health status for racial and ethnic minorities are related to social inequality, and differences in markers of socioeconomic status, such as income, education, and occupation, account for the majority of difference in health status.[13] Poorer communities have higher rates of preventable hospitalizations than wealthy communities.[14] Studies examining patterns of preventable hospitalizations have consistently found higher rates for black and Hispanic individuals compared to non-Hispanic whites,[15,16,17] and Massachusetts data reflects these disparities. Non-Hispanic Blacks have consistently higher rates for all PH conditions compared to Hispanics and Non-Hispanic Whites.

- Congestive Heart Failure: Blacks have preventable hospitalization rates twice that of the Hispanic population and Whites.
- COPD/Asthmas in older adults: Blacks and Hispanics consistently had higher PH rates than Whites, although there was variation over time. Rates for Blacks decreased from 2008 to 2010, and rates for Hispanics increased.
- Diabetes-related conditions: Rates of PHs for Blacks were more than three times as high as rates for Whites across the four diabetes conditions tracked in this study.

The Massachusetts Department of Public Health (DPH) tracks racial disparities for many health status indicators in order to identify high-priority areas for intervention. In the publication *Health of Massachusetts - 2010,* Dr. Stuart Chipkin highlighted the need for "new policies and programs to target prevention strategies, environmental changes and at-risk communities" in order to reduce racial and ethnic disparities in health status, and improve the health of the most vulnerable populations in the Commonwealth.

11 Epstein, AJ. "The role of public clinics in preventable hospitalizations among vulnerable populations." *Health Services Research*. 2001; 36(2): 405-420.

12 Stranges, E., Stocks, C. *Potentially Preventable Hospitalizations for Acute and Chronic Conditions, 2008.* HCUP Statistical Brief #99. November 2010. Agency for Healthcare Research and Quality, Rockville, MD.

13 Williams DR, Braboy Jackson P. "Social Sources of Racial Disparities in Health." *Health Affairs*. 2005: 24(2):325-334.

14 Wier, L. (Thomson Reuters), Merrill, C.T. (Thomson Reuters), and Elixhauser, A. (AHRQ). *Hospital Stays among People Living in the Poorest Communities, 2006*. HCUP Statistical Brief #73. May 2009. Agency for Healthcare Research and Quality, Rockville, MD.

15 Russo, C. A., Andrews, R. M., and Coffey, R. M. *Racial and Ethnic Disparities in Potentially Preventable Hospitalizations, 2003.* HCUP Statistical Brief #10. July 2006. Agency for Healthcare Research and Quality, Rockville, MD.

16 Laditka JN, Laditka SB, Mastanduno MP. "Hospital utilization for ambulatory care sensitive conditions: health outcome disparities associated with race and ethnicity." *Soc Sci Med.* 2003;57:1429-1441.

17 Decker SL, Schappert SM, Sisk JE. "Use of medical care for chronic conditions." *Health Affairs.* 2009; 28:26-35.

Discussion and Conclusion

Our analysis found that the rates and costs of preventable hospitalizations have not increased measurably in recent years. Given that other health service categories have experienced average annual growth rates of 5 percent or more, it does not appear that preventable hospitalizations are driving health care cost growth in general.[18] However, the total costs of preventable hospitalizations in Massachusetts are not insignificant, accounting for 8 percent of total inpatient costs, or 3 percent of total health expenditures.[19] Preventable hospitalizations are also higher in age and socioeconomic groups linked to insufficient access to primary care services.

It is widely agreed that the best approach to reducing preventable hospitalizations is to effectively manage many chronic conditions between non-acute health care settings.[20,21] However, the prevalent fee-for-service payment system offers disincentives to providers for working together to reduce the use of unnecessary or duplicative services, or to engage in care management activities that reduce the need for more expensive healthcare. This incentive structure, inherent to the fee-for-service payments, is increasingly seen as an obstacle to delivering efficient, coordinated care.[22,23]

Our analysis provides some insight into identifying priority areas for reducing preventable hospitalizations. Adults over age 65 account for nearly two-thirds of PHs in Massachusetts. The high rate of hospitalizations of older adults from long-term care facilities, and the barriers to adequate care coordination between those facilities and hospitals, is well documented in clinical literature.[24,25,26] Broad implementation of electronic health records (EHR) and development of its real-time portability between different types of care facilities have strong potential to reduce preventable hospitalizations for residents of long-term care facilities.[27,28,29] However, this potential is unlikely to be realized absent appropriate incentives for care coordination. Such incentives are limited for providers serving Medicare beneficiaries.

16 Division of Health Care Finance and Policy. *Massachusetts Health Care Cost Trends: Trends in Health Expenditures,* June 2011.

17 Centers for Medicare & Medicaid Services: National Health Expenditures Accounts. Data derived from Health Spending by State of Residence, 1991–2009. https://www.cms.gov/NationalHealthExpendData

18 Ouslander JG, Berenson RA. "Reducing unnecessary hospitalizations of nursing home residents." *NEJM.* 2011: 365(13): 1165-1167.

19 Boutwell AE, Hwu S. *Effective interventions to reduce rehospitalizations: a survey of published evidence.* Cambridge (MA)*:* Institute for Healthcare Improvement; 2009.

20 Davis K. "Paying for care episodes and care coordination." *NEJM*. 2007: 356(11): 1166-1168.

21 Institute of Medicine. *Rewarding provider performance: Aligning incentives in Medicare*. Washington, DC: National Academies Press, 2006.

22 Ouslander JG, Lamb G, Perloe M, Givenss JH, Kluge L, Rutlands T, Atherly A, Saliba D. "Potentially avoidable hospitalizations of nursing home residents: Frequency, causes, and costs." *Journal of the American Geriatrics Society*. 2010: 58:627-635.

23 Grabowski DC, O'Malley J, Barhydt NR. "The costs and potential savings associated with nursing home hospitalizations." *Health Affairs*. 2007: 26, no.6:1753-1761.

24 Carter MW. "Factors associated with ambulatory care-sensitive hospitalizations among nursing home residents." *Journal of Aging and Health*. 2003: 15, no. 2: 295-331.

25 Young Y, Inamdar S, Dichter BS, Kilburn H, Hannan EL. "Clinical and nonclinical factors associated with potentially preventable hospitalizations among nursing home residents in New York state." *Journal of the American Medical Directors Association.* June 2001: 2, no. 5: 364-371.

26 Crotty M, Rowett D, Spurling L, Giles LC, Phillips PA. "Does the addition of a pharmacist transition coordinator improve evidence-based medication management and health outcomes in older adults moving from the hospital to a long-term care facility? Results of a randomized, controlled trial." *American Journal of Geriatric Pharmacotherapy.* 2004: 2 (4): 257–64.

27 Shaughnessy PW, Hittle DF, Crisler KS, Powell MC, Richard AA, Kramer AM, Schlenker RE, Steiner JF, Donelan-McCall NS, Beaudry JM, Mulvey-Lawlor KL, Engle K. "Improving patient outcomes of home health care: Findings from two demonstration trials of outcome-based quality improvement." *Journal of the American Geriatrics Society.* 2002: 50 (8): 1354–64.

Various initiatives are underway in Massachusetts to better integrate care across the entire population. The Center for Medicare and Medicaid Services (CMS) have designated five provider organizations in the state as Pioneer Accountable Care Organizations (ACOs). Over the next three years Medicare will shift its payment arrangements with these providers, moving from a shared savings payment model to a population-based payment model.[30] This incentive structure supports providers' efforts to manage the health of patients in non-acute care settings, and reduce preventable hospitalizations. In addition, Massachusetts has received nearly $3.8 million in federal funding to support health information technology initiatives, including a $1.7 million grant to support the transfer of clinical information for patients moving between acute care environments and long-term care facilities.[31]

Overall, the rates and costs of preventable hospitalizations in Massachusetts remained stable in recent years. Although it is encouraging that preventable hospitalizations have not experienced the cost growth rates seen for other medical services, they remain a significant expenditure that represents inefficiency in health care delivery resulting in poor quality outcomes for patients. The continued development of alternative payment structures that promote better integration of health care services, particularly for older adults, has the potential to reduce rates of preventable hospitalizations, and increase the value of health care in Massachusetts.

30 Centers for Medicare and Medicaid Services (Fact Sheet): "Pioneer Accountable Care Organization Model: General Fact Sheet." December 19, 2011.

31 Massachusetts Executive Office of Health and Human Services (Press Release): PATRICK-MURRAY ADMINISTRATION ANNOUNCES $3.8 MILLION IN FEDERAL FUNDING FOR HEALTH IT. February 3, 2011.

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